

PART 1 GENERAL

1.1 DESCRIPTION

- .1 This section specifies requirements for supply and placing stone rip-rap for erosion protection at locations and to dimensions indicated on drawings or designated by the Departmental Representative.

1.2 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Section 31 32 21 - Geotextiles.

1.3 MEASUREMENT PROCEDURES

- .1 Rip-rap: Supply and placement of stone rip-rap, including the cost of all plant, labour, equipment and materials required to complete the work as specified, will be measured by the cubic metre place measurement (CMPM). The volume of material will be determined in place from surveys taken by the contractor prior to and at completion of the work. Surveys to be completed in the presence of the Departmental Representative. Surveys to be provided in a format and method approved by the Departmental Representative. No separate payment will be made for surveys.
- .2 Rock Scour Protection: Supply and placement of rock scour protection, including the cost of all plant, labour, equipment and materials required to complete the work as specified, will be measured by the cubic metre place measurement (CMPM). The volume of material will be determined in place from surveys taken by the contractor prior to and at completion of the work. Surveys to be completed in the presence of the Departmental Representative. Surveys to be provided in a format and method approved by the Departmental Representative. No separate payment will be made for surveys.

PART 2 PRODUCTS

2.1 RIP-RAP

- .1 Hard, dense with relative density (formally specific gravity) not less than 2.65, durable quarry stone, free from seams, cracks or other structural defects, to meet following size distribution for use intended:
 - .1 Rip-rap:
 - .1 Bottom layer: Well graded with maximum sizes not exceeding 300 mm on any one side and a minimum size of not less than 200 mm on any side.
 - .2 Top layer: Well graded with maximum sizes not exceeding 700 mm on any one side and a minimum size of not less than 500 mm on any side.
 - .3 Supply rock spalls to fill open joints.
 - .4 Field stones of appropriate sizes are acceptable.

2.2 ROCK SCOUR PROTECTION

- .1 Hard, dense with relative density (formally specific gravity) not less than 2.65, durable quarry stone, free from seams, cracks or other structural defects, to meet following size distribution for use intended:
 - .1 Rock Scour Protection:
 - .1 Well graded with maximum sizes not exceeding 200 kg as shown on drawings.
 - .2 Field stones of appropriate sizes are acceptable.
 - .3 Absorption, 1.5 to 2% maximum as determined by ASTM C127 test procedure.
 - .4 Durability, less than 35% abrasion wear, ASTM C535 test procedure.
 - .5 Sulphate Soundness Determination maximum 12% by ASTM C88.

PART 3 EXECUTION

3.1 PLACING

- .1 Confirm elevations as provided on design drawings.
- .2 Place rip-rap and scour protection as directed to thickness and details indicated on drawings or as designated by Departmental Representative.
- .3 Where stone is to be placed on slopes, excavate trench at toe of slope to dimensions as indicated.
- .4 All side slopes to be one (1) vertical to one and one half (1.5) horizontal.
- .5 Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.
- .6 Place stones in manner approved by Departmental Representative to secure surface and create a stable mass. Place larger stones at bottom of slopes.
- .7 Dumping of rip-rap will not be permitted.
- .8 Hand placing:
 - .1 Use larger stones for lower courses and as headers for subsequent courses.
 - .2 Stagger vertical joints and fill voids with rock spalls or cobbles.
 - .3 Finish surface evenly, free of large openings and neat in appearance.
- .9 Rip-rap shall be carefully placed in two (2) layers perpendicular to slope on areas indicated on drawings.

END OF SECTION